

Name: \_\_\_\_\_

**Math 10F&PC**

Date: \_\_\_\_\_

**Chapter 6 Linear Functions Review #2**

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y = mx + b$$

$$Ax + By + C = 0$$

$$m = \frac{y - y_1}{x - x_1}$$

$$(y - y_1) = m(x - x_1)$$

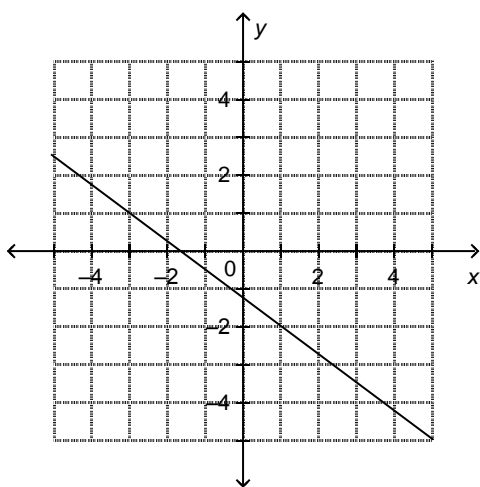
1. A line passes through J(-10, 10) and K(7, -9). Determine the coordinates of L so that line JL is perpendicular to line JK.

- a. L(27, 9)  
b. L(-19, 17)

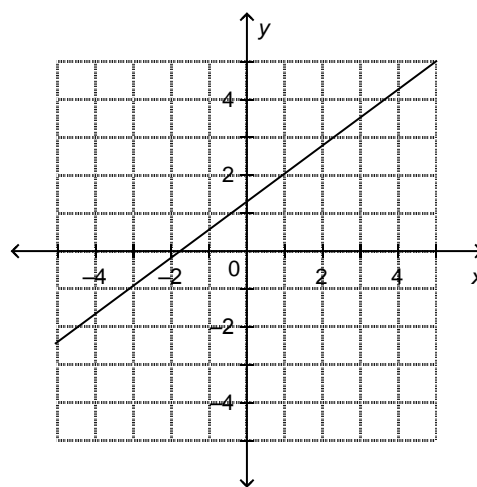
- c. L(17, -19)  
d. L(9, 27)

2. Which graph represents the equation  $y + 1 = \frac{3}{4}(x + 3)$ ?

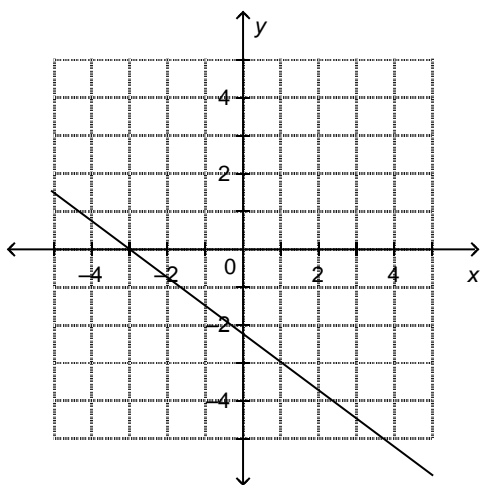
a.



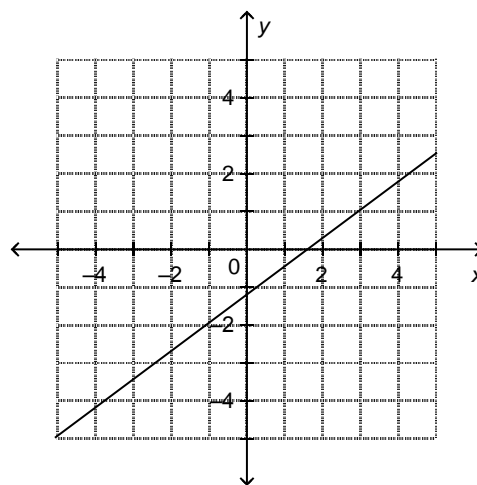
c.



b.



d.



3. Write an equation in slope-point form for the line that passes through A(-2, 4) and B(-9, 6).

a.  $y - 6 = -\frac{2}{7}(x + 2)$

c.  $y - 4 = -\frac{2}{7}(x + 2)$

b.  $y + 4 = -\frac{2}{7}(x - 2)$

d.  $y + 6 = \frac{2}{7}(x - 2)$

4. A line has  $x$ -intercept  $-9$  and  $y$ -intercept  $3$ . Determine the equation of the line in general form.
- a.  $3x + 9y - 27 = 0$                       c.  $3x - 9y + 27 = 0$   
b.  $3x - 9y - 27 = 0$                       d.  $3x + 9y + 27 = 0$

5. Determine the slope of the line that passes through  $G(3, -3)$  and  $H(-5, 9)$ .

6. A road drops  $0.7$  m for every  $4.7$  m measured horizontally. What is the rise of the road?

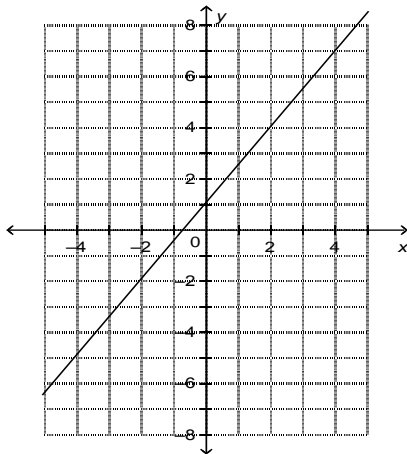
7. A line has  $x$ -intercept  $2$  and  $y$ -intercept  $6$ ? Determine the slope of the line.

8. The slope of a line is  $\frac{11}{17}$ . What is the slope of a line that is parallel to this line?

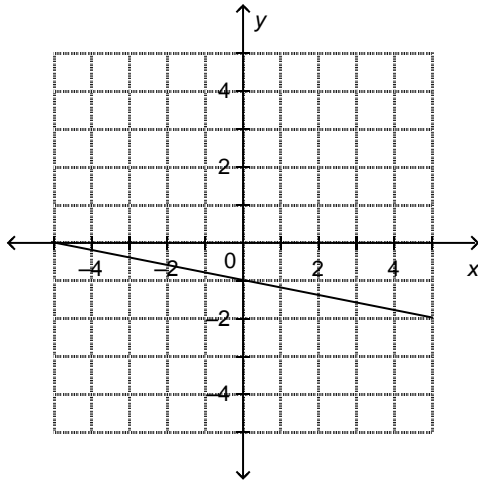
9. The slope of a line is  $\frac{2}{3}$ . What is the slope of a line that is perpendicular to this line?

10. A line has  $x$ -intercept  $7$  and  $y$ -intercept  $-5$ . Determine the slope of a line perpendicular to this line.

11. The slope of this line is  $\frac{3}{2}$ . What is the equation of the line?

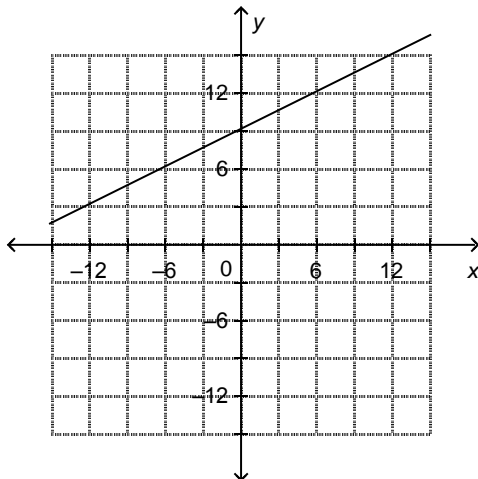


12. Write an equation to describe this graph.



13. To join a tennis club, Josephine pays a start-up fee of \$130, plus a monthly fee of \$24. Write an equation to represent the total cost,  $C$  dollars, for  $t$  months of membership.

14. Write an equation to describe this graph.



15. Use the equation  $y = -\frac{7}{2}x - 4$  to calculate the value of  $y$  when  $x = 10$ .

16. Write an equation for the graph of a linear function that has slope  $\frac{2}{7}$  and passes through  $S(-4, 5)$ .

17. Write this equation in slope-intercept form:  $y - 3 = -\frac{1}{5}(x + 2)$
18. Determine the  $y$ -intercept of the graph of this equation:  $y - 3 = 4(x + 5)$
19. Write an equation for the line that passes through  $T(-3, 3)$  and is parallel to the line  $y = 7x - 10$ .
20. Write an equation for the line that passes through  $U(3, -7)$  and is perpendicular to the line  $y = \frac{1}{7}x - 9$ .
21. Write this equation in general form:  $y + 5 = \frac{5}{3}(x - 3)$
22. Determine the  $x$ -intercept and the  $y$ -intercept for the graph of this equation:  $2x - 3y + 36 = 0$
23. Determine the slope of the line with this equation:  $7x + 3y + 5 = 0$
24. Merny needs a 132-ft. string of outdoor lights. She has  $m$  12-ft. strings and  $n$  16-ft. strings. Write an equation for the relation.
25. A 10-ft. ladder leans against a wall. The base of the ladder is on level ground 6 ft. from the wall. What is the slope of the ladder?

26. The coordinates of the endpoints of segments are given below. Are the two line segments parallel, perpendicular, or neither?

a)  $R(-2, 8)$ ,  $S(-12, -4)$  and  $T(3, -1)$ ,  $U(9, 4)$

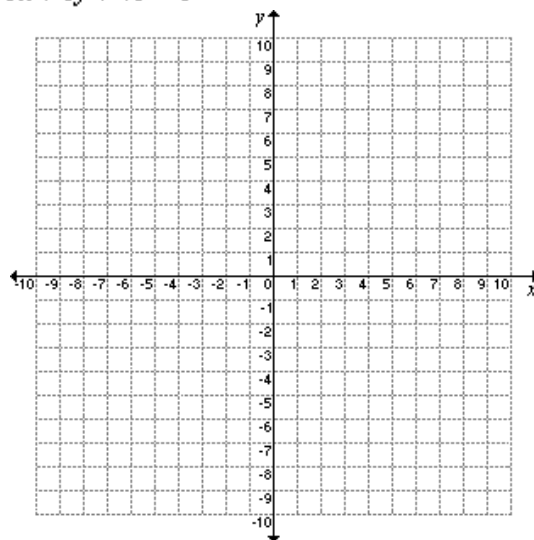
b)  $F(-7, -8)$ ,  $G(-4, 1)$  and  $V(-4, 10)$ ,  $W(14, 4)$

27. The total cost for a cheese of the month club is a flat fee of \$15, plus \$9.50 per month. Write an equation to represent the total cost,  $C$  dollars, for  $m$  months of membership.

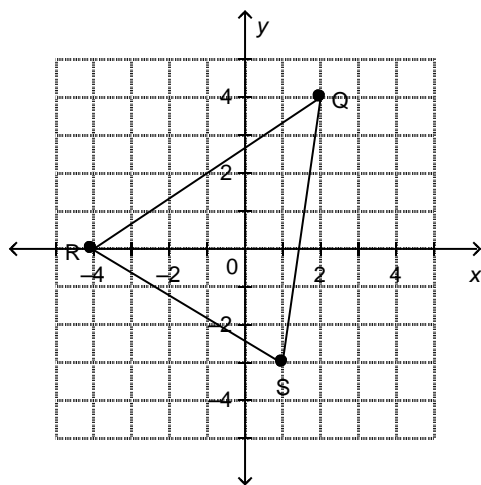
28. Write an equation for the line that passes through  $E(-3, -7)$  and  $F(2, 10)$ . Write the equation in slope-point form and in slope-intercept form.

29. a) Determine the  $x$ - and  $y$ -intercepts of the graph of this equation:  $5x + 8y + 40 = 0$

b) Graph the equation.



30. Determine the slope of each line segment.

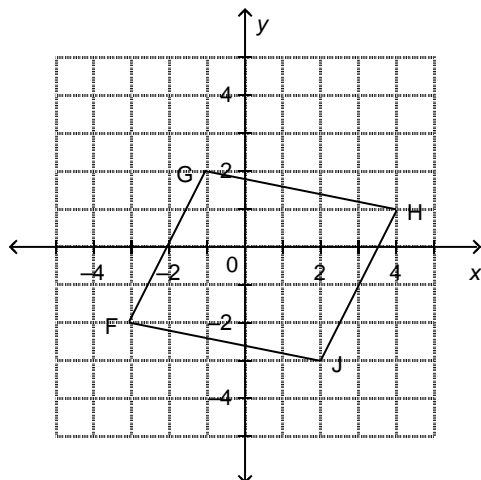


RQ \_\_\_\_\_

RS \_\_\_\_\_

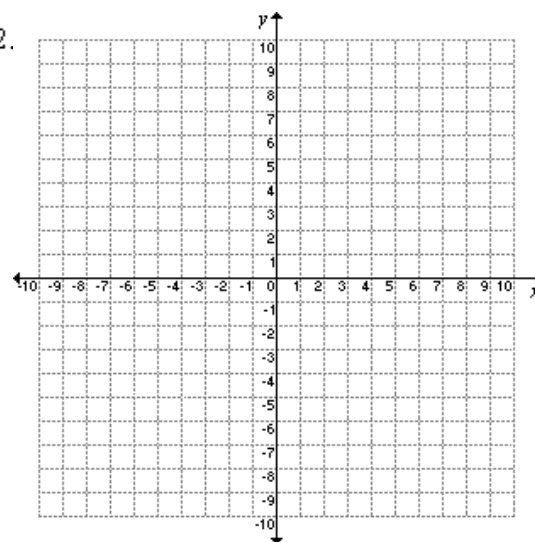
SQ \_\_\_\_\_

31. Reggie says FGHI is a parallelogram. Ann says FGHI is a rectangle. Who is correct? Justify your answer.

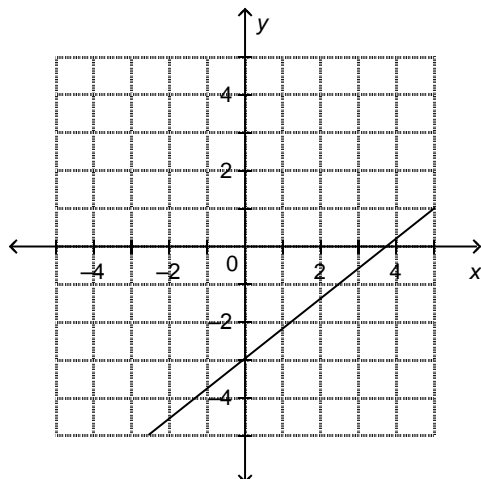


32. Describe the graph of the linear function whose equation is  $y = \frac{2}{5}x + 2$ .

Draw this graph



33. Write an equation to describe this function. Verify the equation.



34. Determine the value of  $k$  when the equations  $3kx - 7y - 10 = 0$  and  $2x + y - 7 = 0$  represent lines that are:

a) parallel

b) perpendicular

35. Find the equation of a line with slope  $-\frac{2}{3}$  that passes through the point  $(-3, 9)$  in point-slope form. Then convert it to the slope-intercept form.

36. an equation for the line that passes through the point  $(1, -2)$  and is:

. a) Parallel to the line  $y = 2x + 5$

b) Perpendicular to the line  $y = -3x + 2$

## Answer Section

1. D
2. C
3. C
4. C
5.  $-\frac{3}{2}$
6.  $-0.7$
7.  $-3$
8.  $\frac{11}{17}$
9.  $-\frac{3}{2}$
10.  $-\frac{7}{5}$
11.  $y = \frac{3}{2}x + 1$
12.  $y = -\frac{1}{5}x - 1$
13.  $C = 24t + 130$
14.  $f(x) = \frac{1}{2}x + 9$
15.  $-39$
16.  $y - 5 = \frac{2}{7}(x + 4)$
17.  $y = -\frac{1}{5}x + \frac{13}{5}$
18. 23
19.  $y - 3 = 7(x + 3)$
20.  $y + 7 = -7(x - 3)$
21.  $5x - 3y - 30 = 0$
22.  $x$ -intercept:  $-18$ ;  $y$ -intercept: 12
23.  $-\frac{7}{3}$
24.  $12m + 16n - 132 = 0$
25.  $\frac{\sqrt{64}}{6}$
26. a) Neither  
b) Perpendicular
27.  $C = 9.50m + 15$
28.  $y + 7 = \frac{17}{5}(x + 3)$        $y = \frac{17}{5}x + \frac{16}{5}$

or

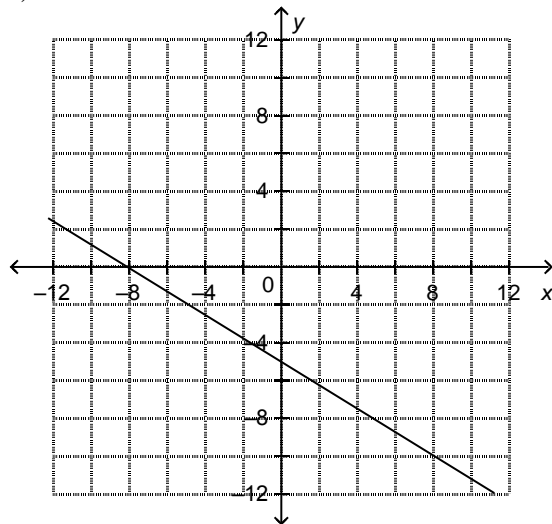
$$y - 10 = \frac{17}{5}(x - 2) \qquad y = \frac{17}{5}x + \frac{16}{5}$$



29. a)  $x$ -intercept:  $-8$

$y$ -intercept:  $-5$

b)



30. Count units to determine the rise and run. Line segment RQ has slope  $\frac{2}{3}$ .

From R to S,  $y$  is decreasing, so the rise is  $-3$ ;  $x$  is increasing, so the run is 5. Line segment RS has slope  $-\frac{3}{5}$ .

From S to Q, both  $x$  and  $y$  are increasing, so the rise is 7 and the run is 1. Line segment SQ has slope 7.

31. A parallelogram has opposite sides equal.

To check whether FGHJ is a parallelogram, determine whether opposite sides are parallel.

Write the coordinates of the vertices:

$F(-3, -2)$ ,  $G(-1, 2)$ ,  $H(4, 1)$ ,  $J(2, -3)$ ,

$$\text{Slope of GH} = \frac{-1}{5}$$

$$\text{Slope of FJ} = \frac{-1}{5}$$

$$\text{Slope of HJ} = \frac{-4}{-2} \quad \text{The slope of HJ is 2.}$$

$$\text{Slope of GF} = \frac{-4}{-2} \quad \text{The slope of GF is 2.}$$

The slopes of opposite sides are equal, so FGHJ is a parallelogram.

A rectangle has angles that are right angles.

To check whether FGHJ is a rectangle, determine whether two intersecting sides are perpendicular.

Determine whether GF is perpendicular to GH.

The slope of GF is 2.

The slope of GH is  $-\frac{1}{5}$ .

Since the slopes of GF and GH are not negative reciprocals, GF and GH are not perpendicular. This means that  $\angle FGH$  is not a right angle and that FGHJ is not a rectangle.

So, Reggie is correct.

32. The graph has a slope of  $\frac{2}{5}$  and a y-intercept of 2.

33. Use the equation:  $y = mx + b$

To write the equation of a linear function, determine the slope of the line,  $m$ , and its y-intercept,  $b$ .

The line intersects the y-axis at  $-3$ ; so,  $b = -3$ .

From the graph, the rise is 4 when the run is 5.

$$\text{So, } m = \frac{4}{5}$$

Substitute for  $m$  and  $b$  in  $y = mx + b$ .

$$y = \frac{4}{5}x - 3$$

An equation for the function is:  $y = \frac{4}{5}x - 3$

To verify the equation, substitute the coordinates of a point on the line into the equation. Choose the point  $(0, -3)$ .

Substitute  $x = 0$  and  $y = -3$  into the equation:  $y = \frac{4}{5}x - 3$

Since the left side is equal to the right side, the equation is correct.

34. a) Rewrite  $2x + y - 7 = 0$  in slope-intercept form.

From the equation, the slope of the line is  $-2$ .

Rewrite  $3kx - 7y - 10 = 0$  in slope-intercept form.

From the equation, the slope of the line is  $\frac{3k}{7}$ .

Any line parallel to  $y = -2x - 7$  has slope  $-2$ . When the lines are parallel,  $k$  is  $-\frac{14}{3}$ .

- b) Any line perpendicular to  $y = -2x - 7$  has a slope that is the negative reciprocal of  $-2$ ; that is, its slope is  $\frac{1}{2}$ .

When the lines are perpendicular,  $k$  is  $\frac{7}{6}$ .